

Notice of Allowability

Application No.

10/648,930

Examiner

Cindy D. Khuu

Applicant(s)

ADAM, GOTTFRIED

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. This communication is responsive to 10/19/06.
2. The allowed claim(s) is/are 1-3 and 5-17.
3. Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some* c) None of the:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 1) hereto or 2) to Paper No./Mail Date _____.
(b) including changes required by the attached Examiner's Amendment / Comment or in the Office action of
 Paper No./Mail Date _____.
6. DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. Notice of References Cited (PTO-892)
2. Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. Information Disclosure Statements (PTO/SB/08),
 Paper No./Mail Date _____
4. Examiner's Comment Regarding Requirement for Deposit
 of Biological Material
5. Notice of Informal Patent Application
6. Interview Summary (PTO-413),
 Paper No./Mail Date _____
7. Examiner's Amendment/Comment
8. Examiner's Statement of Reasons for Allowance
9. Other _____.

DETAILED ACTION

Examiner's Amendment

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given by Mr. John Musone during a telephone interview on 11/02/06.

The application has been amended as follows:

Claims:

Cancel claim 4

Amend claim 1 as followed:

-- A method for the evaluating and modifying the operating conditions of a machine or an installation, comprising the steps of:

measuring at least one parameter a number of times to create a database, which comprises values (x_1, y_1) to (x_n, y_n) of the parameter;

determining an extrapolation range, x_s ;

performing an extrapolation in the range x_s ;

determining a measure of quality, K , of the extrapolation calculated on the basis of the database wherein K is a function of at least two variables taken from the group consisting of V , ΔI , S , C , with V being a ratio of the value range of the database to the extrapolation range, x_s which is determined by $x_s > x_1, x_n$ with ΔI being the x uncertainty of the adjustment curve in the x direction, with S being continuity as a measure of the change in the y values in the database and with C being the time constancy of the extrapolation; and

controlling the parameter value so that the value will be retained within a limit,
wherein the evaluation of the operating conditions is used to optimize the operation of the machine
or the installation. --

Amend claim 3 as followed:

-- A method according to Claim 1, wherein the ~~evaluation of the operating conditions increases optimization is effective to increase~~ the operational dependability of the machine or the installation, by influencing the parameter accordingly based on the measure of quality K. --

Amend claim 11 as followed:

-- A method according to Claim 1, wherein:
the database is divided into at least three segments;
a mean value g_1, g_2, g_3 and a linear adjustment function y_1, y_2, y_3 with gradients c_1, c_2 and c_3 are each calculated for each segment from the database;
a numerical curvature measure p , whereby $p = g_1 - 2*g_2 + g_3$ is calculated, which reflects the current direction of curvature of the gradient pattern;
from a curve repertoire of curve types at least of the group:

Linear function	$\rightarrow f(x) = y = a_0 + a_1 * x$
Potency function	$\rightarrow f(x) = 1n y = 1na_0 + a_1 * 1nx$
Logarithmic function	$\rightarrow f(x) = y = a_0 + a_1 * 1n x$
Exponential function	$\rightarrow f(x) = 1n y = 1na_0 + a_1 x$

that curve type of the adjustment function is selected iteratively and adjusted in respect of the value range of the entire current database, with the curve type selected from the curve repertoire having to satisfy the following conditions;

the direction of curvature of the curve, which is determined from the extrapolation, must correspond to that of p and the quotient Q_k of numerator (= if necessary weighted mean of the distance squares between measurement values and extrapolation curve) and denominator (= mean square of the y value range of the extrapolation curve in the area of the data window) must be minimal:

$$Q_k = f(k) = \frac{\sum w_i * (y_i(x_i) - f_k(x_i))^2}{y_{mitt_k}^2 * \sum w_i} = \min (i = 1 \dots \min)$$

where k is a numerator of the available extrapolation curve types (curve répertoire) in particular $y_{mitt_k}^2 = [(y_{max_k} + y_{min_k})/2]^2$,

with $Y_i(x_i)$ being the measurement value at point x_i , with $f_k(x_i)$ being the function value of the kth extrapolation curve type at point x_i , with w_i being a weighting factor for each individual measurement value or for all measurement values of a segment;

so that the continuity S is calculated as follows:

$$S = \frac{\sum \gamma_i * (C_i - O_i)^2}{\sum \gamma_i}$$

with $i = 1 \dots 3$ being the numbering for the segment areas, with γ_i : weighting factors 1...n, with O_1 to O_3 being the gradients of the selected kth curve for the extrapolation in respect of each half segment width, and with C_1 to C_3 being the gradients of the linear segment adjustments. --

Amend claim 12 as followed:

-- A method according to Claim 1, wherein determination of the x uncertainty includes:
selection of an extrapolation function, which can be transferred to linear structures from the group consisting of

Linear function $\rightarrow y = a_0 + a_1 * x$

Potency function $\rightarrow \ln y = \ln a_0 + a_1 * \ln x$

Logarithmic function $\rightarrow y = a_0 + a_1 * \ln x$

Exponential function $\rightarrow \ln y = \ln a_0 + a_1 * x$,

determination of a database,

with the database comprising n correlated x and y values

Calculation of \bar{x} and \bar{y} of the database and the variable $\sum x_i y_i$

Calculation of $S_{xy} = \frac{1}{n-1} (\sum x_i y_i - \bar{x} \bar{y})$ ($i = 1 \dots n$)

Calculation of $S_x^2 = \frac{1}{n-1} (\sum x_i - \bar{x})^2$ ($i = 1 \dots n$)

Calculation of $S_y^2 = \frac{1}{n-1} (\sum y_i - \bar{y})^2$ ($i = 1 \dots n$)

Calculation of a gradient $b = \frac{S_{xy}}{S_x^2}$

Calculation of $a = (n-1)(S_y^2 - b^2 S_x^2)$

Determination of an equation for a regression line

$$y = \bar{y} + b(x - \bar{x})$$

with a confidence factor γ , a variable $F(c)$ is calculated according to

$$F(c) = \frac{1}{2}(1 + \gamma),$$

with $F(c)$ and $n-2$ (n = number of measurement values), degrees of freedom, the t-distribution (Student distribution) gives a value c ,

Determination of Δm

$$\frac{c\sqrt{a}}{S_x \sqrt{(n-1)(n-2)}}$$

which gives an uncertainty of the gradient m :

$$b - \Delta m \leq m \leq b + \Delta m,$$

Determination of the straight line equations with the gradients $b - \Delta m$, $b + \Delta m$,

Determination of the points of intersection (l_{\min} , constant) and (l_{\max} , constant) of the straight line with a parallel ($y = \text{constant}$),

which corresponds to a limit value,

Determination of corresponding x values l_{\max} and l_{\min} ,

where $l_{\max} > l_{\min}$,

$$\text{Calculation of } \Delta l = l_{\max} - l_{\min}.$$

Pertinent Art Cited

The following US Patent Applications reveal the current state of the art:

Gotoh et al. (US 7,065,471) teaches a method for the evaluating and modifying the operating conditions of a machine or an installation (Abstract, lines 2-3), comprising the steps of:

measuring at least one parameter a number of times to create a database (Column 6, lines 46-50; Column 7, lines 28-33), which comprises values (x_1, y_1) to (x_n, y_n) of the parameter (Fig. 10);
determining an extrapolation range, x_s (Fig. 10; t₃); and
performing an extrapolation in the range x_s (Fig. 10).

However, Gotoh does not teach a method of determining a measure of quality, K, of the extrapolation calculated on the basis of the database wherein K is a function of at least two variables taken from the group consisting of V, ΔI, S, C, with V being a ratio of the value range of the database to the extrapolation range, x_s which is determined by $x_s > x_1, x_n$ with ΔI being the x uncertainty of the adjustment curve in the x direction, with S being continuity as a measure of the change in the y values in the database and with C being the time constancy of the extrapolation.

Allowable Subject Matter

Claims 1-3 and 5-17 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

The primary reason for the allowance of claim 1 is the inclusion of the limitation "determining a measure of quality, K, of the extrapolation calculated on the basis of the database wherein K is a function of at least two variables taken from the group consisting of V, ΔI, S, C, with V being a ratio of the value range of the database to the extrapolation range, x_s which is determined by $x_s > x_1, x_n$ with ΔI being the x uncertainty of the adjustment curve in the x direction, with S being continuity as a measure of the change in

the y values in the database and with C being the time constancy of the extrapolation". The prior art of record, taken alone or in combination, fails to disclose or render obvious.

Claims 2-3 and 5-17 are allowed due to their dependency on claim 1.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Fax/Telephone Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cindy D. Khuu whose telephone number is (571) 272-8585. The examiner can normally be reached on M-F, 7:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CML 11/7/06


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